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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/712,420 | 11/13/2000 | Michael J. Daneman | ONX-109 | 9691 |

7590 02/13/2003
Joshua D. Isenberg
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Fremont, CA 94539

EXAMINER

CULBERT, ROBERTS P

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1763

DATE MAILED: 02/13/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | | |
|------------------------------|-----------------|--|-------------------|--|
| Office Action Summary | Application N . | | Applicant(s) | |
| | 09/712,420 | | DANEMAN ET AL. #9 | |
| | Examiner | | Art Unit | |
| | Roberts Culbert | | 1763 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 23 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-25 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-16, 23, and 24 in Paper No. 8 is acknowledged. The traversal is on the ground(s) that claims 1 and 16 are proper product by process claims. This is not found persuasive because Applicant has not given any reason why the product as claimed cannot be made by another and materially different process.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16, 23, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrase "defining one or more structures between the selected trenches" is unclear in light of the specification because it cannot be determined what the structures are or how they are "defined". It is not clear if the structures are added as an additional feature (e.g. the comb fingers of Fig 2E.), or simply a region of the substrate "defined" between the trenches. Furthermore, the step of releasing the structures is unclear. If the structures are simply regions of the substrate "defined" between trenches, then it is unclear how any portion is released since etching destroys the region. Further, it is unclear if there are any steps involved in the "defining" process or if defining is merely involves visual recognition of a location.

Regarding claim 16, it is also unclear in light of the specification and drawings what and where the "structures" are, and how they are "defined". For example, it is not clear if the structures are portions of etch stop material, portions of the device layer between trenches or some other additional feature.

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Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference number not mentioned in the description: 412. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The amendment filed 1/30/03 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material that is not supported by the original disclosure is as follows: There is no support for the formation of lined trenches. The specification clearly states on page 5, line 2, that the etch-stop material *completely* fills the trenches. As stated by the applicant in the amendment filed 1/30/03, filling a trench and lining a trench are distinct methods of depositing a material.

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

Applicant's arguments filed 1/30/03 have been fully considered but they are not persuasive. The applicant has argued that Shaw does not teach *filling* the trenches. Applicant has also provided a definition of the word "fill" to demonstrate that filling a trench and lining a trench are distinct methods of depositing a material, and that Shaw does not show filling a trench, as claimed, but instead lines the floor and walls of the trench.

The examiner does not dispute the definition provided by applicant for the word "fill". Also it is clear that the Shaw reference does not show "filling" a trench as defined by applicant. However, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., filling a trench) are not recited in the rejected claim(s). The claims only recite *depositing* a material. Although the claims are interpreted in light of the

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specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Therefore the prior art rejections are maintained as recited below.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5,7,9,10-15, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,426,070 to Shaw et al.

Referring to the Figures, Shaw teaches a method for the controlled release of structures. Trenches are formed in a silicon device layer (Fig.1E). Structures are defined on each side of the trench. An etch-stop material (silicon dioxide) is deposited in the trench and over the surface of the device layer (Fig.1F). Openings are formed in the etch-stop material (Fig.1G). The surface of the device layer is masked (Fig.1H), and the structure is released by etching (Fig.1I). The etching undercuts a portion of the etch-stop material (Fig.1I). The layer of device material is disposed between two layers of etch-stop material (Fig.1I). A structural layer is formed proximate to the device layer and is protected from the silicon layer by the etch-stop layer (Fig.1J). A portion of this structural layer is released, and contains two sub layers. (Fig.1J).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,426,070 to Shaw et al.

Regarding claim 6, as applied above, Shaw discloses the method of the invention substantially as claimed, but uses reactive ion etching to release the vertical structure from the substrate. Shaw does not

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show wet etching. It is well-known in the semiconductor art that both wet and dry chemical etching methods are suitable for etching grooves in silicon. U.S. Patent 5,084,419 to Sakao shows that wet etching and dry etching are art-recognized equivalents for the purpose of etching grooves in silicon (Column 5 Lines 17-24), and it has been held that substitution of one art-recognized equivalent for another is *prima facie* obvious. *In re Fout*, 297, 213 USPQ 532 (CCPA 1982).

Regarding claim 8, as applied above, Shaw discloses the method of the invention substantially as claimed, but uses a crystalline silicon substrate as a device layer. Shaw does not show the use of a silicon-on-insulator (SOI) substrate. It is common practice to fabricate a semiconductor device using a silicon-on-insulator substrate as a starting material. (*Silicon Processing for the VLSI Era* Vol.4, pp.14-15) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a SOI substrate as a starting material in order to produce a semiconductor device with simplified device isolation and processing.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (703) 305-7965. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

February 6, 2003


SHRIVE P. BECK
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